

In the claims:

1-55. (Canceled)

56. (new) A population of cells comprising at least two subpopulations of cells, wherein a first subpopulation of said at least two subpopulation of cells includes a first reporter expression construct being expressible in a cell of said first subpopulation when exposed to a first analyte and whereas a second subpopulation of said at least two subpopulation of cells includes a second reporter expression construct being expressible in a cell of said second subpopulation when exposed to a second analyte.

57. (new) The population of cells of claim 56, wherein each of said reporter expression construct includes a cis-acting regulatory element being operably fused to a reporter gene.

58. (new) The population of cells of claim 57, wherein said cis-acting regulatory element is a promoter.

59. (new) The population of cells of claim 58, wherein said promoter is selected from the group consisting of MipA, LacZ, GrpE, Fiu, MalPQ, oraA, nhoA, recA, otsAB and yciD

60. (new) The population of cells of claim 56, wherein each of said first or said second analyte is independently selected from the group consisting of a condition and a substance.

61. (new) The population of cells of claim 56, wherein each of said at least two subpopulations of cells is tagged.

62. (new) A device for detecting presence, absence or level of a substance in a sample, the device comprising a substrate being configured for supporting a population of cells including at least two subpopulations of cells, wherein a first subpopulation of said at least two subpopulations of cells includes a first reporter expression construct being expressible in a cell of said first subpopulation when exposed to a first analyte and whereas a second subpopulation of said at least two subpopulation of cells includes a second reporter expression construct being

expressible in a cell of said second subpopulation when exposed to a second analyte, wherein each of said at least two subpopulations of cells is attached to said substrate in an addressable manner.

63. (new) The device of claim 62, wherein each of said reporter expression construct includes a cis-acting regulatory element being operably fused to a reporter gene.

64. (new) The device of claim 63, wherein said cis-acting regulatory element is a promoter.

65. (new) The device of claim 64, wherein said promoter is selected from the group consisting of MipA, LacZ, GrpE, Fiu, MalPQ, oraA, nhoA, recA, otsAB and yciD.

66. (new) A system for detecting presence, absence or level of a substance in a sample, the system comprising:

(a) a device including a substrate being configured for supporting a population of cells including at least two subpopulations of cells, wherein a first subpopulation of said at least two subpopulations of cells includes a first reporter expression construct being expressible in a cell of said first subpopulation when exposed to a first analyte and whereas a second subpopulation of said at least two subpopulation of cells includes a second reporter expression construct being expressible in a cell of said second subpopulation when exposed to a second analyte, wherein each of said at least two subpopulations of cells is attached to said substrate in an addressable manner;

(b) a detector for detecting expression from each of said first and second reporter expression constructs in said population of cells; and

(c) a processing unit for obtaining and processing data representing said expression detected by said detector to thereby provide information relating to the presence, absence or level of the substance in the sample.

67. (new) A method of detecting presence, absence or level of a substance in a sample, the method comprising:

(a) exposing a population of cells to the sample, said population of cells including at least two subpopulations of cells, wherein a first subpopulation of said at least two subpopulations of cells includes a first reporter expression construct being expressible in a cell of said first subpopulation when exposed to a first analyte and whereas a second subpopulation of said at least two subpopulation of cells includes a second reporter expression construct being expressible in a cell of said second subpopulation when exposed to a second analyte with the sample; and

(b) analyzing expression of said reporter expression constructs in each of said at least two subpopulations of cells, to thereby detect presence, absence or level of the substance in the sample.

68. (new) The method of claim 67, wherein each of said reporter expression construct includes a cis-acting regulatory element being operably fused to a reporter gene.

69. (new) The method of claim 67, wherein said reporter gene is selected from a group consisting of a fluorescent protein, an enzyme and an affinity tag.

70. (new) The method of claim 68, wherein said cis-acting regulatory element is a promoter

71. (new) The method of claim 70, wherein said promoter is selected from the group consisting of MipA, LacZ, GrpE, Fiu, MalPQ, oraA, nhoA, recA, otsAB and yciD.

72. (new) The method of claim 67, wherein each of said first or said second analyte is independently selected from the group consisting of a condition and a substance.

73. (new) The method of claim 67, wherein each of said at least two subpopulations of cells is tagged.

74. (new) The method of claim 67, wherein analyzing expression is effected by a pattern recognition software.